

What is claimed is:

1. A gamma signal supplying apparatus, comprising:
  - a timing controller for storing predetermined gamma values as digital values, and for transmitting one of the digital values serially;
  - a gamma digital-to-analog controller (DAC) for receiving the serial digital gamma value, and for converting the serial digital gamma value into a first analog gamma value; and
  - a plurality of column drive units, each of the plurality of column drive units for generating a second analog gamma value, for comparing the second analog gamma value to the first analog gamma value, and for outputting a gray level value based on the second analog gamma value if both values are substantially identical.
2. The apparatus of claim 1, wherein the column drive unit includes a resistor array having a plurality of resistors, the column drive unit for sequentially reading voltage values on the respective resistors and for outputting a read voltage value as the second analog gamma value if the read voltage value is substantially identical to the first analog gamma value.
3. The apparatus of claim 2, wherein the plurality of resistors in the resistor subdivide each gamma value stored in the timing controller into the smaller gamma values.
4. The apparatus of claim 2, wherein the column drive unit further comprises:
  - a resistor array having a plurality of resistors;
  - a comparator for comparing the first analog gamma value with the second analog gamma value;
  - a buffer unit for buffering the second analog gamma value;
  - a switch unit including a plurality of switches, each of the plurality of switches having a first port connected to respective resistors of the resistor array, a second port connected to the comparator, and a third port connected

to the buffer unit, wherein the first port is connected to the second or third port according to a predetermined control signal;

a control unit for probing each resistor of the resistor array sequentially and outputting the predetermined control signal in order for the buffer unit to buffer the second analog gamma value according to a comparison result of the comparator; and

a gray level resistor array for outputting a gray level value based on the value stored in the buffer unit.

5. The apparatus of claim 4, wherein the plurality of resistors in the resistor array subdivide each gamma value stored in the timing controller into the smaller gamma values within each corresponding predetermined range.

6. The apparatus of claim 1, wherein the column drive unit further comprises:

a resistor array having a plurality of resistors;

a comparator for comparing the first analog gamma value with the second analog gamma value;

a buffer unit for buffering the second analog gamma value;

a switch unit including a plurality of switches, each of the plurality of switches having a first port connected to respective resistors of the resistor array, a second port connected to the comparator, and a third port connected to the buffer unit, wherein the first port is connected to the second or third port according to a predetermined control signal;

a control unit for probing each resistor array sequentially and for outputting the predetermined control signal in order for the buffer unit to buffer the second analog gamma value according to a comparison result of the comparator; and

a gray level resistor array for outputting a gray level value based on the value stored in the buffer unit.

7. A gamma signal supplying apparatus, comprising:

a timing controller for storing a predetermined gamma values as digital values, for transmitting one of the digital gamma values serially, and for outputting a reference digital code;

a gamma digital-to-analog converter (DAC) for receiving the serial digital gamma value, for converting the digital gamma value into a first analog gamma value, for comparing the first analog gamma value to a second analog gamma value input from a following unit, and for outputting the comparison result to the timing controller; and

a plurality of column drive units, each the plurality of column drive units for receiving the reference digital code, for generating a second analog gamma value corresponding to the reference digital code to output the same to the gamma DAC, for receiving a predetermined indication signal from the timing controller, and for outputting a gray level value based on the second analog gamma value,

wherein the timing controller receives the comparison result, and outputs the indication signal to the corresponding column drive unit if the first and second analog the gamma values are substantially identical.

8. The apparatus of claim 7, wherein the timing controller outputs another reference digital code to the corresponding column drive unit if the first and second analog gamma values are not substantially identical, this being repeated until the first and second analog gamma values are substantially identical.

9. The apparatus of claim 8, wherein the column drive unit includes a resistor array having a plurality of resistors, the column drive unit for reading a voltage value of a resistor at a location corresponding to the reference digital code, and for generating the second analog gamma value.

10. The apparatus of claim 9, wherein the plurality of resistors in the resistor array subdivide each gamma value stored in the timing controller into the smaller gamma values.

11. The apparatus of claim 7, wherein the column drive unit includes a resistor array having a plurality of resistors, the column drive unit for reading a voltage value of a resistor at a location corresponding to the reference digital code, and for generating the second analog gamma value.

12. The apparatus of claim 8, wherein the column drive unit further comprises:

- a resistor array having a plurality of resistors;
- a comparator for comparing the first analog gamma value with the second analog gamma value;
- a buffer unit for buffering the second analog gamma value;
- a switch unit including a plurality of switches, each of the plurality of switches having a first port connected to respective resistors of the resistor array, a second port connected to the comparator, and a third port connected to the buffer unit, wherein the first port is connected to the second or third port according to a predetermined control signal;
- a control unit for probing each resistor of the resistor array sequentially and for outputting the predetermined control signal in order for the buffer unit to buffer the second analog gamma value according to a comparison result of the comparator; and
- a gray level resistor array for outputting a gray level value based on the value stored in the buffer unit.

13. The apparatus of claim 12, wherein the plurality of resistors in the resistor array subdivide the gamma value stored in the timing controller into the smaller gamma values within each corresponding predetermined range.

14. The apparatus of claim 7, wherein the column drive unit further comprises:

- a resistor array having a plurality of resistors;
- a comparator for comparing the first analog gamma value with the second analog gamma value;
- a buffer unit for buffering the second analog gamma value;

a switch unit including a plurality of switches, each of the plurality of switches having a first port connected to respective resistors of the resistor array, a second port connected to the comparator, and a third port connected to the buffer unit, wherein the first port is connected to the second or third port according to a predetermined control signal;

a control unit for probing each resistor of the resistor array sequentially and for outputting the predetermined control signal in order for the buffer unit to buffer the second analog gamma value according to a comparison result of the comparator; and

a gray level resistor array for outputting a gray level value based on the value stored in the buffer unit.

15. The apparatus of claim 7, wherein the gamma DAC further comprises:

a register unit for receiving the serial digital gamma value and for converting the digital gamma value into a parallel digital gamma value;

a DAC for converting the parallel digital gamma value into the first analog gamma value; and

a comparator for comparing the first analog gamma value to the second analog gamma value input from the following unit, and for outputting a comparison result to the timing controller.

16. A gamma signal supplying apparatus, comprising:

a timing controller for storing predetermined gamma values as digital values, for transmitting one among the stored digital values serially, and for outputting a first reference digital code and a second reference digital code;

a first column drive unit for generating a first analog gamma value corresponding to the first reference digital code, for outputting a gray level value based on the analog gamma value, the first column drive unit including a first comparator for comparing the first analog gamma value with a second analog gamma value input from a following unit, and for outputting the compared result to the timing controller; and

a plurality of second column drive units, each of the second column drive units serially connected and positioned behind the first column drive unit,

for generating a second analog gamma value corresponding to the second reference digital code to output the same to a previous column drive unit, for outputting a gray level value based on the second analog gamma value if a predetermined indication signal is received from the timing controller, The second column drive unit includes a second comparator for comparing the second analog gamma value with a third analog gamma value inputted from a following unit, and for outputting the compared result to the timing controller;

wherein the timing controller outputs the indication signal to one of two column drive units and comparison targets if values compared by the first or second comparator are substantially identical.

17. The apparatus of claim 16, wherein if the second and third analog gamma values are not substantially identical, the timing controller outputs another second reference digital code to a corresponding second column drive unit until both gamma values are substantially identical.

18. The apparatus of claim 16, wherein the first column drive unit includes a resistor array having a plurality of resistors, the first column drive unit for reading a voltage value of a resistor at a location corresponding to the first reference digital code and for generating the first analog gamma value.

19. The apparatus of claim 18, wherein the plurality of resistors in the resistor array subdivide the gamma values stored in the timing controller into the smaller gamma values.

20. The apparatus of claim 16, wherein the first column drive unit further comprises:

a resistor array having a plurality of resistors;

the first comparator for comparing the first analog gamma value with the second analog gamma value, and for outputting a comparison result to the timing controller;

a buffer unit for buffering the first analog gamma value;

a switch unit including a plurality of switches, each of the plurality of switches having a first port connected to respective resistors of the resistor

array, a second port connected to the comparator, and a third port connected to the buffer unit, wherein the first port is connected to the second or third port according to a predetermined control signal;

a control unit for probing each resistor of the resistor array sequentially and for outputting the predetermined control signal in order for the buffer unit to buffer the second analog gamma value according to a comparison result of the comparator; and

a gray level resistor array for outputting a gray level value based on the value stored in the buffer unit.

21. The apparatus of claim 16, wherein the second column drive unit includes a resistor array having a plurality of resistors, the second column drive unit for reading a voltage value of a resistor at a location corresponding to the second reference digital code and for generating the second analog gamma value.

22. The apparatus of claim 21, wherein the plurality of resistors in the resistor array subdivide the gamma value stored in the timing controller into the smaller gamma values.

23. The apparatus of claim 16, wherein the second column drive unit further comprises:

a resistor array having a plurality of resistors;

the second comparator for comparing the second analog gamma value with the third analog gamma value, and for outputting the comparison result to the timing controller;

a buffer unit for buffering the second analog gamma value;

a switch unit including a plurality of switches, each of the plurality of switches having a first port connected to respective resistors of the resistor array, a second port connected to the comparator, and a third port connected to the buffer unit, wherein the first port is connected to the second or third port according to a predetermined control signal;

a control unit for probing each resistor of the resistor array sequentially and for outputting the predetermined control signal in order for the buffer unit

to buffer the second analog gamma value according to a comparison result of the comparator; and

a gray level for outputting a gray level value based on the value stored in the buffer unit.